

SEQUENCE LISTING

<110> Degussa AG

<120> Expression of nitrile hydratases in a two-vector expression system

<130> 040065 AM

<160> 34

<170> PatentIn version 3.1

<210> 1

<211> 624

<212> DNA

<213> Rhodococcus erythropolis

<220>

<221> CDS

<222> (1)..(624)

<223>

<400> 1

atg tca gta acg atc gac cac aca acg gag aac gcc gca ccg gcc cag	48
Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln	
1 5 10 15	
gcg ccg gtc tcc gat cgc gcg tgg gcc ctg ttc cgc gca ctc gac ggt	96
Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly	
20 25 30	
aag gga ttg gta ccc gac ggt tac gtc gag gga tgg aag aag acc ttc	144
Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe	
35 40 45	
gag gag gac ttc agt cca agg cgc gga gcg gaa ttg gtc gcg cgg gcg	192
Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala	
50 55 60	
tgg acc gac ccc gat ttc cgg caa ctg ctt ctc acc gac ggt acc gcc	240
Trp Thr Asp Pro Asp Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala	
65 70 75 80	
gcg gtt gcc cag tac gga tat ctg ggc ccc cag ggc gaa tac atc gtg	288
Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val	
85 90 95	
gca gtc gaa gac acc ccg acc ctc aag aac gtg atc gtg tgc tcg ctg	336
Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu	
100 105 110	
tgt tca tgc acc gcg tgg ccc att ctc ggc ctg ccc cct acc tgg tac	384
Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr	
115 120 125	
aag agt ttc gaa tac cgt gcg cga gtg gtg cgt gag cca cgg aag gtt	432
Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val	
130 135 140	

ctc ttc gag atg gga acc gag atc gcg tcg gac gtc gag atc cgc gtc 480
 Leu Phe Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val
 145 150 155 160

tac gac acc acc gcc gaa act cgc tac atg gtt ctc ccg caa cgt ccc 528
 Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro
 165 170 175

gca ggc acc gaa ggc tgg agc cag gaa cag ctt cag gag atc gtc acc 576
 Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr
 180 185 190

aag gac tgc ctg atc ggc gtc gca gtc ccg cag gtc ccc acc gtc tga 624
 Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val
 195 200 205

<210> 2
 <211> 207
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 2

Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln
 1 5 10 15

Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly
 20 25 30

Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe
 35 40 45

Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala
 50 55 60

Trp Thr Asp Pro Asp Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala
 65 70 75 80

Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val
 85 90 95

Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu
 100 105 110

Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr
 115 120 125

Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val
 130 135 140

Leu Phe Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val
145 150 155 160

Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro
165 170 175

Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr
180 185 190

Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val
195 200 205

<210> 3
<211> 639
<212> DNA
<213> Rhodococcus erythropolis

<220>
<221> CDS
<222> (1)..(639)
<223>

<400> 3
atg gat gga gta cac gat ctt gcc gga gtt caa ggc ttc ggc aaa gtc 48
Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val
1 5 10 15
ccg cat acc gtc aac gcc gac atc ggc ccc acc ttc cac gcc gag tgg 96
Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp
20 25 30
gaa cac ctg ccg tac agc ctg atg ttc gcc ggt gtc gcc gaa ctc ggg 144
Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly
35 40 45
gca ttc agc gtc gac gaa gtt cga tac gtc gtc gag cgg atg gaa cca 192
Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro
50 55 60
cgc cac tac atg atg acc ccg tac tac gag agg tac gtc atc ggc gtc 240
Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val
65 70 75 80
gcg aca ctg atg gtc gaa aag gga atc ctg acg cag gaa gaa ctc gaa 288
Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Glu Glu Leu Glu
85 90 95
agc ctt gca ggg gga ccg ttc cca ctg tcg cgg ccc agc gaa tcc gaa 336
Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu
100 105 110
ggg cgg ccg gca ccc gtc gag acg acc acc ttc gaa atc ggt cag cga 384
Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Ile Gly Gln Arg

115	120	125	
gta cgc gtg cgc gac gag Val Arg Val Arg Asp Glu 130	tac gtt ccg ggg cat Tyr Val Pro Gly His 135	att cga atg cct gcg Ile Arg Met Pro Ala 140	432
tac tgc cgc gga cga gtg Tyr Cys Arg Gly Arg Val 145	gga acc atc tct cat Gly Thr Ile Ser His 150	cgg act acc gag aag Arg Thr Thr Glu Lys 155	480
tgg ccg ttt ccc gac gca Trp Pro Phe Pro Asp Ala 165	atc ggc cac ggg cgc Ile Gly His Gly Arg 170	aac gac gcc ggc gaa Asn Asp Ala Gly Glu 175	528
gaa ccg acg tac cac gtg Glu Pro Thr Tyr His Val 180	aag ttc gac gcc gag Lys Phe Asp Ala Glu 185	gaa ttg ttc ggt agc Glu Leu Phe Gly Ser 190	576
gac acc gac ggc ggc agc Asp Thr Asp Gly Gly Ser 195	gtc gta gtc gac ctt Val Val Val Asp Leu 200	ttc gag ggt tac ctc Phe Glu Gly Tyr Leu 205	624
gag cct gcg gcc tga Glu Pro Ala Ala 210			639

<210> 4
 <211> 212
 <212> PRT
 <213> Rhodococcus erythropolis
 <400> 4

Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val 1 5 10 15
Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp 20 25 30
Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly 35 40 45
Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro 50 55 60
Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val 65 70 75 80
Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Glu Glu Leu Glu 85 90 95
Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu

5

100 105 110
 Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Ile Gly Gln Arg
 115 120 125
 Val Arg Val Arg Asp Glu Tyr Val Pro Gly His Ile Arg Met Pro Ala
 130 135 140
 Tyr Cys Arg Gly Arg Val Gly Thr Ile Ser His Arg Thr Thr Glu Lys
 145 150 155 160
 Trp Pro Phe Pro Asp Ala Ile Gly His Gly Arg Asn Asp Ala Gly Glu
 165 170 175
 Glu Pro Thr Tyr His Val Lys Phe Asp Ala Glu Glu Leu Phe Gly Ser
 180 185 190
 Asp Thr Asp Gly Gly Ser Val Val Val Asp Leu Phe Glu Gly Tyr Leu
 195 200 205
 Glu Pro Ala Ala
 210

<210> 5
 <211> 624
 <212> DNA
 <213> Rhodococcus erythropolis

<220>
 <221> CDS
 <222> (1)..(624)
 <223>

<400> 5
 atg tca gta acg atc gac cac aca acg gag aac gcc gca ccg gcc cag 48
 Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln
 1 5 10 15
 gcg ccg gtc tcc gat cgc gcg tgg gcc ctg ttc cgc gca ctc gac ggt 96
 Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly
 20 25 30
 aag gga ttg gta ccc gac ggt tac gtc gaa gga tgg aag aaa acc ttc 144
 Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe
 35 40 45
 gag gag gac ttc agt cca agg cgc gga gcg gaa ttg gtc gcg cgg gcg 192
 Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala
 50 55 60

tgg acc gac ccc gag ttc cgg cag ttg ctt ctc acc gac ggt acc gcc	240
Trp Thr Asp Pro Glu Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala	
65 70 75 80	
gcg gtt gcc cag tac gga tac ctg ggc ccc cag ggc gag tac atc gtg	288
Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val	
85 90 95	
gca gtc gaa gac acc ccg acc ctc aag aac gtg atc gtg tgc tcg ctg	336
Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu	
100 105 110	
tgt tca tgc acc gcg tgg ccc att ctc ggc ctg ccc cct acc tgg tac	384
Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr	
115 120 125	
aag agt ttc gaa tac cgt gcg cga gtg gtg cgt gag cca cgg aag gtt	432
Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val	
130 135 140	
ctc tcc gag atg gga acc gag atc gcg tcg gac gtc gag atc cgc gtc	480
Leu Ser Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val	
145 150 155 160	
tac gac acc acc gcc gaa act cgc tac atg gtt ctc ccg caa cgt ccc	528
Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro	
165 170 175	
gca ggc acc gaa ggc tgg agc cag gaa caa ctg cag gaa atc gtc acc	576
Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr	
180 185 190	
aag gac tgc ctg atc ggc gtc gca gtc ccg cag gtc ccc acc gtc tga	624
Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val	
195 200 205	

<210> 6
 <211> 207
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 6

Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln	
1 5 10 15	
Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly	
20 25 30	
Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe	
35 40 45	
Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala	
50 55 60	

Trp Thr Asp Pro Glu Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala
65 70 75 80

Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val
85 90 95

Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu
100 105 110

Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr
115 120 125

Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val
130 135 140

Leu Ser Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val
145 150 155 160

Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro
165 170 175

Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr
180 185 190

Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val
195 200 205

<210> 7
<211> 639
<212> DNA
<213> Rhodococcus erythropolis

<220>
<221> CDS
<222> (1) .. (639)
<223>

<400> 7
atg gat gga gta cac gat ctt gcc gga gtt caa ggc ttc ggc aaa gtc 48
Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val
1 5 10 15
ccg cat acc gtc aac gcc gac atc ggc ccc acc ttc cac gcc gag tgg 96
Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp
20 25 30
gaa cac ctg ccg tac agc ctg atg ttc gcc ggt gtc gcc gaa ctc ggg 144
Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly

35	40	45	
gca ttc agc gtc gac gaa gtt cga tac gtc gtc gag cgg atg gaa cca Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro 50 55 60			192
cgc cac tac atg atg acc ccg tac tac gag agg tac gtc atc ggc gtc Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val 65 70 75 80			240
gcg aca ctg atg gtc gaa aag gga atc ctg acg cag gat gaa ctc gaa Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Asp Glu Leu Glu 85 90 95			288
agc ctt gca ggg gga ccg ttc cca ctg tcc cgg ccc agc gaa tcc gaa Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu 100 105 110			336
ggg cgt ccg gca ccc gtc gag acg acc acc ttc gaa atc ggt cag cga Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Ile Gly Gln Arg 115 120 125			384
gta cgc gtg cgc gac gag tac gtt ccg ggg cat att cga atg cct gcg Val Arg Val Arg Asp Glu Tyr Val Pro Gly His Ile Arg Met Pro Ala 130 135 140			432
tac tgc cgc gga cga gtg gga acc atc tct cat cgg act acc gag aag Tyr Cys Arg Gly Arg Val Gly Thr Ile Ser His Arg Thr Thr Glu Lys 145 150 155 160			480
tgg cca ttt ccc gac gca atc ggc cac ggg cgc aac gac gcc ggc gaa Trp Pro Phe Pro Asp Ala Ile Gly His Gly Arg Asn Asp Ala Gly Glu 165 170 175			528
gaa ccg acg tac cac gtg aag ttc gcc gcc gag gaa ttg ttc ggt agc Glu Pro Thr Tyr His Val Lys Phe Ala Ala Glu Glu Leu Phe Gly Ser 180 185 190			576
gac acc gac ggc ggc agc gtc gta gtc gac ctt ttc gag ggt tac ctc Asp Thr Asp Gly Gly Ser Val Val Val Asp Leu Phe Glu Gly Tyr Leu 195 200 205			624
gag cct gcg gcc tga Glu Pro Ala Ala 210			639

<210> 8
 <211> 212
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 8

Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val
1 5 10 15

Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp

9

20 25 30
 Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly
 35 40 45
 Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro
 50 55 60
 Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val
 65 70 75 80
 Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Asp Glu Leu Glu
 85 90 95
 Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu
 100 105 110
 Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Ile Gly Gln Arg
 115 120 125
 Val Arg Val Arg Asp Glu Tyr Val Pro Gly His Ile Arg Met Pro Ala
 130 135 140
 Tyr Cys Arg Gly Arg Val Gly Thr Ile Ser His Arg Thr Thr Glu Lys
 145 150 155 160
 Trp Pro Phe Pro Asp Ala Ile Gly His Gly Arg Asn Asp Ala Gly Glu
 165 170 175
 Glu Pro Thr Tyr His Val Lys Phe Ala Ala Glu Glu Leu Phe Gly Ser
 180 185 190
 Asp Thr Asp Gly Gly Ser Val Val Val Asp Leu Phe Glu Gly Tyr Leu
 195 200 205
 Glu Pro Ala Ala
 210

<210> 9
 <211> 624
 <212> DNA
 <213> Rhodococcus erythropolis

<220>
 <221> CDS
 <222> (1) .. (624)

<223>

<400> 9

atg tca gta acg atc gac cac aca acg gag aac gcc gca ccg gcc cag	48
Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln	
1 5 10 15	
gcg ccg gtc tcc gac cgg gcg tgg gcc ctg ttc cgc gca ctc gac ggt	96
Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly	
20 25 30	
aag gga ttg gta ccc gac ggt tac gtc gag gga tgg aag aag acc ttc	1 44
Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe	
35 40 45	
gag gag gac ttc agt cca agg cgc gga gcg gaa ttg gtc gcg cgg gcg	1 92
Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala	
50 55 60	
tgg acc gac ccc gag ttc cgg cag ttg ctt ctc acc gac ggt acc gcc	2 40
Trp Thr Asp Pro Glu Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala	
65 70 75 80	
gcg gtt gcc cag tac gga tat ctg ggc ccc cag ggc gag tac atc gtg	2 88
Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val	
85 90 95	
gca gtc gaa gac acc ccg acc ctc aag aac gtg atc gtg tgc tcg ttg	3 36
Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu	
100 105 110	
tgt tca tgc acc gcg tgg ccc att ctc ggc ctg ccc cct acc tgg tac	3 84
Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr	
115 120 125	
aag agt ttc gaa tac cgt gcg cga gtg gtg cgt gag cca ccg aag gtt	4 32
Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val	
130 135 140	
ctc tcc gag atg gga acc gag atc gcg tcg gac gtc gag atc cgc gtc	4 80
Leu Ser Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val	
145 150 155 160	
tac gac acc acc gcc gaa act cgc tac atg gtt ctc ccg caa cgt ccc	5 2 8
Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro	
165 170 175	
gca ggc acc gaa ggc tgg agc cag gaa cag ctt caa gag atc gtc acc	5 7 6
Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr	
180 185 190	
aag gac tgc ctg atc ggc gtc gca gtc ccg cag gtc ccc acc gtc tga	6 2 4
Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val	
195 200 205	

<210> 10

<211> 207

<212> PRT

<213> Rhodococcus erythropolis

<400> 10

Met Ser Val Thr Ile Asp His Thr Thr Glu Asn Ala Ala Pro Ala Gln
1 5 10 15

Ala Pro Val Ser Asp Arg Ala Trp Ala Leu Phe Arg Ala Leu Asp Gly
20 25 30

Lys Gly Leu Val Pro Asp Gly Tyr Val Glu Gly Trp Lys Lys Thr Phe
35 40 45

Glu Glu Asp Phe Ser Pro Arg Arg Gly Ala Glu Leu Val Ala Arg Ala
50 55 60

Trp Thr Asp Pro Glu Phe Arg Gln Leu Leu Leu Thr Asp Gly Thr Ala
65 70 75 80

Ala Val Ala Gln Tyr Gly Tyr Leu Gly Pro Gln Gly Glu Tyr Ile Val
85 90 95

Ala Val Glu Asp Thr Pro Thr Leu Lys Asn Val Ile Val Cys Ser Leu
100 105 110

Cys Ser Cys Thr Ala Trp Pro Ile Leu Gly Leu Pro Pro Thr Trp Tyr
115 120 125

Lys Ser Phe Glu Tyr Arg Ala Arg Val Val Arg Glu Pro Arg Lys Val
130 135 140

Leu Ser Glu Met Gly Thr Glu Ile Ala Ser Asp Val Glu Ile Arg Val
145 150 155 160

Tyr Asp Thr Thr Ala Glu Thr Arg Tyr Met Val Leu Pro Gln Arg Pro
165 170 175

Ala Gly Thr Glu Gly Trp Ser Gln Glu Gln Leu Gln Glu Ile Val Thr
180 185 190

Lys Asp Cys Leu Ile Gly Val Ala Val Pro Gln Val Pro Thr Val
195 200 205

<210> 11

<211> 639

<212> DNA

<213> Rhodococcus erythropolis

<220>

<221> CDS

<222> (1) .. (639)

<223>

<400> 11

atg gat gga gta cac gat ctt gcc gga gtt caa ggc ttc ggc aaa gtc	48
Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val	
1 5 10 15	
ccg cat acc gtc aac gcc gac atc ggc ccc acc ttc cac gcc gag tgg	96
Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp	
20 25 30	
gaa cac ctg ccg tac agc ctg atg ttc gcc ggt gtc gcc gaa ctc ggg	144
Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly	
35 40 45	
gca ttc agc gtc gac gaa gtt cga tac gtc gtc gag cgg atg gaa cca	192
Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro	
50 55 60	
cgc cac tac atg atg acc ccg tac tac gag agg tac gtc atc ggc gtc	240
Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val	
65 70 75 80	
gcg aca ctg atg gtc gaa aag gga atc ctg acg cag gaa gaa ctc gaa	288
Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Glu Glu Leu Glu	
85 90 95	
agc ctt gca ggg gga ccg ttc cca ctg tcc cgg cca agc gaa tcc gaa	336
Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu	
100 105 110	
ggg cgt ccg gca ccc gtc gag acg acc acc ttc gaa gtc ggt cag cga	384
Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Val Gly Gln Arg	
115 120 125	
gta cgc gtg cgc gac gag tac gtt ccg ggg cat att cga atg cct gcg	432
Val Arg Val Arg Asp Glu Tyr Val Pro Gly His Ile Arg Met Pro Ala	
130 135 140	
tac tgc cgc gga cga gtg gga acc atc tct cat cgg act acc gag aag	480
Tyr Cys Arg Gly Arg Val Gly Thr Ile Ser His Arg Thr Thr Glu Lys	
145 150 155 160	
tgg cca ttt ccc gac gca atc ggc cac ggg cgc aac gac gcc ggc gaa	528
Trp Pro Phe Pro Asp Ala Ile Gly His Gly Arg Asn Asp Ala Gly Glu	
165 170 175	
gaa ccg acg tac cac gtg aag ttc gac gcc gag gaa ttg ttc ggt agc	576
Glu Pro Thr Tyr His Val Lys Phe Asp Ala Glu Glu Leu Phe Gly Ser	
180 185 190	
gac acc gac ggc ggc agc gtc gta gtc gac ctt ttc gag ggt tac ctc	624
Asp Thr Asp Gly Gly Ser Val Val Val Asp Leu Phe Glu Gly Tyr Leu	
195 200 205	

13

gag cct gcg gcc tga
 Glu Pro Ala Ala
 210

639

<210> 12
 <211> 212
 <212> PRT
 <213> Rhodococcus erythropolis
 <400> 12

Met Asp Gly Val His Asp Leu Ala Gly Val Gln Gly Phe Gly Lys Val
 1 5 10 15

Pro His Thr Val Asn Ala Asp Ile Gly Pro Thr Phe His Ala Glu Trp
 20 25 30

Glu His Leu Pro Tyr Ser Leu Met Phe Ala Gly Val Ala Glu Leu Gly
 35 40 45

Ala Phe Ser Val Asp Glu Val Arg Tyr Val Val Glu Arg Met Glu Pro
 50 55 60

Arg His Tyr Met Met Thr Pro Tyr Tyr Glu Arg Tyr Val Ile Gly Val
 65 70 75 80

Ala Thr Leu Met Val Glu Lys Gly Ile Leu Thr Gln Glu Glu Leu Glu
 85 90 95

Ser Leu Ala Gly Gly Pro Phe Pro Leu Ser Arg Pro Ser Glu Ser Glu
 100 105 110

Gly Arg Pro Ala Pro Val Glu Thr Thr Thr Phe Glu Val Gly Gln Arg
 115 120 125

Val Arg Val Arg Asp Glu Tyr Val Pro Gly His Ile Arg Met Pro Ala
 130 135 140

Tyr Cys Arg Gly Arg Val Gly Thr Ile Ser His Arg Thr Thr Glu Lys
 145 150 155 160

Trp Pro Phe Pro Asp Ala Ile Gly His Gly Arg Asn Asp Ala Gly Glu
 165 170 175

Glu Pro Thr Tyr His Val Lys Phe Asp Ala Glu Glu Leu Phe Gly Ser
 180 185 190

Asp Thr Asp Gly Gly Ser Val Val Val Asp Leu Phe Glu Gly Tyr Leu
 195 200 205

Glu Pro Ala Ala
 210

<210> 13
 <211> 612
 <212> DNA
 <213> Rhodococcus erythropolis

<220>
 <221> CDS
 <222> (1)..(612)
 <223>

<400> 13
 gtg agc gag cac gtc aat aag tac acg gag tac gag gca cgt acc aag 48
 Val Ser Glu His Val Asn Lys Tyr Thr Glu Tyr Glu Ala Arg Thr Lys
 1 5 10 15
 gca atc gaa act ttg ctg tac gag cga ggg ctc atc acg ccc gcc gcg 96
 Ala Ile Glu Thr Leu Leu Tyr Glu Arg Gly Leu Ile Thr Pro Ala Ala
 20 25 30
 gtc gac cga gtc gtt tcg tac tac gag aac gag atc ggc ccg atg ggc 144
 Val Asp Arg Val Val Ser Tyr Tyr Glu Asn Glu Ile Gly Pro Met Gly
 35 40 45
 ggt gcc aag gtc gtg gcg aag tcc tgg gtg gac cct gag tac cgc aag 192
 Gly Ala Lys Val Val Ala Lys Ser Trp Val Asp Pro Glu Tyr Arg Lys
 50 55 60
 tgg ctc gaa gag gac gcg acg gcc gcg atg gcg tca ttg ggc tat gcc 240
 Trp Leu Glu Glu Asp Ala Thr Ala Ala Met Ala Ser Leu Gly Tyr Ala
 65 70 75 80
 ggt gag cag gca cac caa att tcg gcg gtc ttc aac gac tcc caa acg 288
 Gly Glu Gln Ala His Gln Ile Ser Ala Val Phe Asn Asp Ser Gln Thr
 85 90 95
 cat cac gtg gtg gtg tgc act ctg tgt tcg tgc tat ccg tgg ccg gtg 336
 His His Val Val Val Cys Thr Leu Cys Ser Cys Tyr Pro Trp Pro Val
 100 105 110
 ctt ggt ctc ccg ccc gcc tgg tac aag agc atg gag tac ccg tcc cga 384
 Leu Gly Leu Pro Pro Ala Trp Tyr Lys Ser Met Glu Tyr Arg Ser Arg
 115 120 125
 gtg gta gcg gac cct cgt gga gtg ctc aag cgc gat ttc ggt ttc gac 432
 Val Val Ala Asp Pro Arg Gly Val Leu Lys Arg Asp Phe Gly Phe Asp
 130 135 140
 atc ccc gat gag gtg gag gtc agg gtt tgg gac agc agc tcc gaa atc 480
 Ile Pro Asp Glu Val Glu Val Arg Val Trp Asp Ser Ser Ser Glu Ile

15

145	150	155	160	
cgc tac atc gtc atc ccg gaa cgg ccg gcc ggc acc gac ggt tgg tcc				528
Arg Tyr Ile Val Ile Pro Glu Arg Pro Ala Gly Thr Asp Gly Trp Ser				
	165	170	175	
gag gac gag ctg gcg aag ctg gtg agt cgg gac tcg atg atc ggt gtc				576
Glu Asp Glu Leu Ala Lys Leu Val Ser Arg Asp Ser Met Ile Gly Val				
	180	185	190	
agt aat gcg ctc aca ccc cag gaa gtg atc gta tga				612
Ser Asn Ala Leu Thr Pro Gln Glu Val Ile Val				
	195	200		

<210> 14
 <211> 203
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 14

Val Ser Glu His Val Asn Lys Tyr Thr Glu Tyr Glu Ala Arg Thr Lys
1 5 10 15

Ala Ile Glu Thr Leu Leu Tyr Glu Arg Gly Leu Ile Thr Pro Ala Ala
20 25 30

Val Asp Arg Val Val Ser Tyr Tyr Glu Asn Glu Ile Gly Pro Met Gly
35 40 45

Gly Ala Lys Val Val Ala Lys Ser Trp Val Asp Pro Glu Tyr Arg Lys
50 55 60

Trp Leu Glu Glu Asp Ala Thr Ala Ala Met Ala Ser Leu Gly Tyr Ala
65 70 75 80

Gly Glu Gln Ala His Gln Ile Ser Ala Val Phe Asn Asp Ser Gln Thr
85 90 95

His His Val Val Val Cys Thr Leu Cys Ser Cys Tyr Pro Trp Pro Val
100 105 110

Leu Gly Leu Pro Pro Ala Trp Tyr Lys Ser Met Glu Tyr Arg Ser Arg
115 120 125

Val Val Ala Asp Pro Arg Gly Val Leu Lys Arg Asp Phe Gly Phe Asp
130 135 140

Ile Pro Asp Glu Val Glu Val Arg Val Trp Asp Ser Ser Ser Glu Ile

Ser Asn Ala Leu Thr Pro Gln Glu Val Ile Val
195 200

```
<220>
<221> CDS
<222> (1) .. (690)
<223>
```

<400>	15															
atg	gat	ggt	atc	cac	gac	aca	ggc	ggc	atg	acc	gga	tac	gga	ccg	gtc	48
Met	Asp	Gly	Ile	His	Asp	Thr	Gly	Gly	Met	Thr	Gly	Tyr	Gly	Pro	Val	
1				5					10					15		
ccc	tat	cag	aag	gac	gag	ccc	ttc	ttc	cac	tac	gag	tgg	gag	ggt	cgg	96
Pro	Tyr	Gln	Lys	Asp	Glu	Pro	Phe	Phe	His	Tyr	Glu	Trp	Glu	Gly	Arg	
			20					25					30			
acc	ctg	tcg	att	ctg	acc	tgg	atg	cat	ctc	aag	ggc	atg	tcg	tgg	tgg	144
Thr	Leu	Ser	Ile	Leu	Thr	Trp	Met	His	Leu	Lys	Gly	Met	Ser	Trp	Trp	
		35					40					45				
gac	aag	tcg	cgg	ttc	ttc	cgg	gag	tcg	atg	ggg	aac	gaa	aac	tac	gtc	192
Asp	Lys	Ser	Arg	Phe	Phe	Arg	Glu	Ser	Met	Gly	Asn	Glu	Asn	Tyr	Val	
	50					55					60					
aac	gag	att	cgc	aac	tcg	tac	tac	acc	cac	tgg	ctg	agt	gcg	gca	gaa	240
Asn	Glu	Ile	Arg	Asn	Ser	Tyr	Tyr	Thr	His	Trp	Leu	Ser	Ala	Ala	Glu	
65					70					75					80	
cgt	atc	ctc	gtc	gcc	gac	aag	atc	atc	acc	gaa	gaa	gag	cga	aag	cac	288
Arg	Ile	Leu	Val	Ala	Asp	Lys	Ile	Ile	Thr	Glu	Glu	Glu	Arg	Lys	His	
				85				90						95		
cgt	gtg	cag	gag	atc	ctc	gag	ggt	cgg	tac	acg	gac	agg	aac	ccg	tcg	336
Arg	Val	Gln	Glu	Ile	Leu	Glu	Gly	Arg	Tyr	Thr	Asp	Arg	Asn	Pro	Ser	
			100					105					110			
cgg	aag	ttc	gat	ccg	gcc	gag	atc	gag	aag	gcg	atc	gaa	cgg	ctt	cac	384
Arg	Lys	Phe	Asp	Pro	Ala	Glu	Ile	Glu	Lys	Ala	Ile	Glu	Arg	Leu	His	
		115					120					125				

gag ccc cac tcc cta gca ctt cca gga gcg gag ccg agt ttc tcc ctc 432
 Glu Pro His Ser Leu Ala Leu Pro Gly Ala Glu Pro Ser Phe Ser Leu
 130 135 140

ggt gac aag gtc aaa gtg aag aat atg aac ccg ctg gga cac aca cgg 480
 Gly Asp Lys Val Lys Val Lys Asn Met Asn Pro Leu Gly His Thr Arg
 145 150 155 160

tgc ccg aaa tat gtg cgg aac aag atc ggg gaa atc gtc acc tcc cac 528
 Cys Pro Lys Tyr Val Arg Asn Lys Ile Gly Glu Ile Val Thr Ser His
 165 170 175

ggc tgc cag atc tat ccc gag agc agc tcc gcc ggc ctc ggc gac gat 576
 Gly Cys Gln Ile Tyr Pro Glu Ser Ser Ser Ala Gly Leu Gly Asp Asp
 180 185 190

ccc cgc ccg ctc tac acg gtc gcg ttt tcc gcc cag gaa ctg tgg ggc 624
 Pro Arg Pro Leu Tyr Thr Val Ala Phe Ser Ala Gln Glu Leu Trp Gly
 195 200 205

gac gac gga aac ggg aaa gac gta gtg tgc gtc gat ctc tgg gaa ccg 672
 Asp Asp Gly Asn Gly Lys Asp Val Val Cys Val Asp Leu Trp Glu Pro
 210 215 220

tac ctg atc tct gcg tga 690
 Tyr Leu Ile Ser Ala
 225

<210> 16
 <211> 229
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 16

Met Asp Gly Ile His Asp Thr Gly Gly Met Thr Gly Tyr Gly Pro Val
 1 5 10 15

Pro Tyr Gln Lys Asp Glu Pro Phe Phe His Tyr Glu Trp Glu Gly Arg
 20 25 30

Thr Leu Ser Ile Leu Thr Trp Met His Leu Lys Gly Met Ser Trp Trp
 35 40 45

Asp Lys Ser Arg Phe Phe Arg Glu Ser Met Gly Asn Glu Asn Tyr Val
 50 55 60

Asn Glu Ile Arg Asn Ser Tyr Tyr Thr His Trp Leu Ser Ala Ala Glu
 65 70 75 80

Arg Ile Leu Val Ala Asp Lys Ile Ile Thr Glu Glu Glu Arg Lys His
 85 90 95

18

Arg Val Gln Glu Ile Leu Glu Gly Arg Tyr Thr Asp Arg Asn Pro Ser
 100 105 110

Arg Lys Phe Asp Pro Ala Glu Ile Glu Lys Ala Ile Glu Arg Leu His
 115 120 125

Glu Pro His Ser Leu Ala Leu Pro Gly Ala Glu Pro Ser Phe Ser Leu
 130 135 140

Gly Asp Lys Val Lys Val Lys Asn Met Asn Pro Leu Gly His Thr Arg
 145 150 155 160

Cys Pro Lys Tyr Val Arg Asn Lys Ile Gly Glu Ile Val Thr Ser His
 165 170 175

Gly Cys Gln Ile Tyr Pro Glu Ser Ser Ser Ala Gly Leu Gly Asp Asp
 180 185 190

Pro Arg Pro Leu Tyr Thr Val Ala Phe Ser Ala Gln Glu Leu Trp Gly
 195 200 205

Asp Asp Gly Asn Gly Lys Asp Val Val Cys Val Asp Leu Trp Glu Pro
 210 215 220

Tyr Leu Ile Ser Ala
 225

<210> 17
 <211> 22
 <212> DNA
 <213> Artificial

<220>
 <223> Primer

<400> 17
 gcccgcataa gaaaagggtga ac

22

<210> 18
 <211> 21
 <212> DNA
 <213> Artificial

<220>
 <223> Primer

<400> 18

gcatgccttc aaatcagcct g 21

<210> 19
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 19
agggtgaacc atatgtcagt aacg 24

<210> 20
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 20
tgtcggatcc atcagacggt gg 22

<210> 21
<211> 23
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 21
agcaccatat ggatggagta cac 23

<210> 22
<211> 21
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 22
gttgggaatt caggccgcag g 21

<210> 23
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 23
cgcggatcca agaaggagat atacatg

27

<210> 24
<211> 22
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 24
ccgcaacggtt caaacggtct gg

22

<210> 25
<211> 27
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 25
aggaatacgc atatgagcga gcacgtc

27

<210> 26
<211> 30
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 26
gtgtggatcc actcatacga tcacttcctg

30

<210> 27
<211> 31
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 27
aggaatgagc atatggatgg tatccacgac a

31

<210> 28
<211> 33
<212> DNA
<213> Artificial

<220>
<223> Primer

21

<400> 28
atcgggatcc tttcacgcag agatcaggta cgg 33

<210> 29
<211> 35
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 29
ctcaggatcc aaggagtgat cgtatgagtg aagac 35

<210> 30
<211> 26
<212> DNA
<213> Artificial

<220>
<223> Primer

<400> 30
acaggagctc tcagtcgatg atggcc 26

<210> 31
<211> 315
<212> DNA
<213> Rhodococcus erythropolis

<220>
<221> CDS
<222> (1)..(315)
<223>

<400> 31
atg agt gaa gac aca ctc act gat cgg ctc ccg gcg act ggg acc gcc 48
Met Ser Glu Asp Thr Leu Thr Asp Arg Leu Pro Ala Thr Gly Thr Ala
1 5 10 15

gca ccg ccc cgc gac aat ggc gag ctt gta ttc acc gag cct tgg gaa 96
Ala Pro Pro Arg Asp Asn Gly Glu Leu Val Phe Thr Glu Pro Trp Glu
20 25 30

gca acg gca ttc ggg gtc gcc atc gcg ctt tcg gat cag aag tcg tac 144
Ala Thr Ala Phe Gly Val Ala Ile Ala Leu Ser Asp Gln Lys Ser Tyr
35 40 45

gaa tgg gag ttc ttc cga cag cgt ctc att cac tcc atc gct gag gcc 192
Glu Trp Glu Phe Phe Arg Gln Arg Leu Ile His Ser Ile Ala Glu Ala
50 55 60

aac ggt tgc gag gca tac tac gag agc tgg aca aag gcg ctc gag gcc 240
Asn Gly Cys Glu Ala Tyr Tyr Glu Ser Trp Thr Lys Ala Leu Glu Ala
65 70 75 80

22

agc gtg gtc gac tcg ggg ctg atc agc gaa gat gag atc cgc gag cgc 288
 Ser Val Val Asp Ser Gly Leu Ile Ser Glu Asp Glu Ile Arg Glu Arg
 85 90 95

atg gaa tcg atg gcc atc atc gac tga 315
 Met Glu Ser Met Ala Ile Ile Asp
 100

<210> 32
 <211> 104
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 32

Met Ser Glu Asp Thr Leu Thr Asp Arg Leu Pro Ala Thr Gly Thr Ala
 1 5 10 15

Ala Pro Pro Arg Asp Asn Gly Glu Leu Val Phe Thr Glu Pro Trp Glu
 20 25 30

Ala Thr Ala Phe Gly Val Ala Ile Ala Leu Ser Asp Gln Lys Ser Tyr
 35 40 45

Glu Trp Glu Phe Phe Arg Gln Arg Leu Ile His Ser Ile Ala Glu Ala
 50 55 60

Asn Gly Cys Glu Ala Tyr Tyr Glu Ser Trp Thr Lys Ala Leu Glu Ala
 65 70 75 80

Ser Val Val Asp Ser Gly Leu Ile Ser Glu Asp Glu Ile Arg Glu Arg
 85 90 95

Met Glu Ser Met Ala Ile Ile Asp
 100

<210> 33
 <211> 1200
 <212> DNA
 <213> Rhodococcus erythropolis

<220>
 <221> CDS
 <222> (1) .. (1200)
 <223>

<400> 33

atg gtc gac aca cga ctt ccg gtc acg gtg ctg tca ggt ttc ctg ggc 48
 Met Val Asp Thr Arg Leu Pro Val Thr Val Leu Ser Gly Phe Leu Gly
 1 5 10 15

gcc	ggg	aag	acg	aca	cta	ctc	aac	gag	atc	ctg	cga	aat	cga	gag	ggt	96
Ala	Gly	Lys	Thr	Thr	Leu	Leu	Asn	Glu	Ile	Leu	Arg	Asn	Arg	Glu	Gly	
			20					25					30			
cgg	cgg	gtc	gcg	gtg	atc	gtc	aac	gac	atg	agc	gaa	atc	aac	atc	gac	144
Arg	Arg	Val	Ala	Val	Ile	Val	Asn	Asp	Met	Ser	Glu	Ile	Asn	Ile	Asp	
		35					40					45				
agt	gca	gaa	gtc	gag	cgt	gag	atc	tcg	ctc	agt	cgc	tcc	gag	gag	aaa	192
Ser	Ala	Glu	Val	Glu	Arg	Glu	Ile	Ser	Leu	Ser	Arg	Ser	Glu	Glu	Lys	
	50					55					60					
ctg	gtc	gag	atg	acc	aac	ggc	tgc	atc	tgc	tgc	act	ctg	cga	gag	gat	240
Leu	Val	Glu	Met	Thr	Asn	Gly	Cys	Ile	Cys	Cys	Thr	Leu	Arg	Glu	Asp	
65					70					75					80	
ctt	ctt	tcc	gag	atc	agc	gcc	ttg	gcc	gcc	gat	ggc	cga	ttc	gac	tac	288
Leu	Leu	Ser	Glu	Ile	Ser	Ala	Leu	Ala	Ala	Asp	Gly	Arg	Phe	Asp	Tyr	
				85					90					95		
cta	ctc	atc	gaa	tct	tcg	ggc	atc	tcc	gaa	ccg	ctt	ccc	gtc	gca	gag	336
Leu	Leu	Ile	Glu	Ser	Ser	Gly	Ile	Ser	Glu	Pro	Leu	Pro	Val	Ala	Glu	
			100					105					110			
acg	ttc	aca	ttc	atc	gat	acc	gac	ggc	cac	gcc	ctc	gcc	gac	gtc	gcc	384
Thr	Phe	Thr	Phe	Ile	Asp	Thr	Asp	Gly	His	Ala	Leu	Ala	Asp	Val	Ala	
		115					120					125				
cga	ctc	gac	acc	atg	gtc	acc	gtc	gtc	gac	ggc	cac	agt	ttt	ctg	cgc	432
Arg	Leu	Asp	Thr	Met	Val	Thr	Val	Val	Asp	Gly	His	Ser	Phe	Leu	Arg	
	130					135					140					
gac	tac	acg	gct	ggg	ggc	cgc	gtc	gaa	gcc	gat	gcc	ccg	gaa	gac	gaa	480
Asp	Tyr	Thr	Ala	Gly	Gly	Arg	Val	Glu	Ala	Asp	Ala	Pro	Glu	Asp	Glu	
145				150						155					160	
cga	gac	atc	gcg	gat	ctg	ctt	gtc	gat	cag	atc	gaa	ttt	gcc	gac	gtc	528
Arg	Asp	Ile	Ala	Asp	Leu	Leu	Val	Asp	Gln	Ile	Glu	Phe	Ala	Asp	Val	
				165					170					175		
atc	ctg	gtg	agc	aag	gcc	gat	ctc	gtc	tcg	cac	cag	cac	ctg	gtc	gaa	576
Ile	Leu	Val	Ser	Lys	Ala	Asp	Leu	Val	Ser	His	Gln	His	Leu	Val	Glu	
			180					185					190			
ttg	acc	gca	gtc	ctg	cgc	tct	ttg	aac	gca	tcc	gct	gcg	ata	gtt	ccg	624
Leu	Thr	Ala	Val	Leu	Arg	Ser	Leu	Asn	Ala	Ser	Ala	Ala	Ile	Val	Pro	
		195					200					205				
atg	acg	ctc	ggt	cgc	atc	cca	ctc	gac	acg	att	ctc	gac	acc	ggt	ttg	672
Met	Thr	Leu	Gly	Arg	Ile	Pro	Leu	Asp	Thr	Ile	Leu	Asp	Thr	Gly	Leu	
	210					215					220					
ttc	tcg	ctc	gaa	aag	gct	gca	cag	gcc	ccc	gga	tgg	tta	caa	gaa	ctc	720
Phe	Ser	Leu	Glu	Lys	Ala	Ala	Gln	Ala	Pro	Gly	Trp	Leu	Gln	Glu	Leu	
225					230					235					240	
caa	ggt	gaa	cac	atc	ccc	gaa	acc	gaa	gag	tac	gga	atc	agt	tcg	gtg	768
Gln	Gly	Glu	His	Ile	Pro	Glu	Thr	Glu	Glu	Tyr	Gly	Ile	Ser	Ser	Val	

24

245										250					255					
gtg	tac	cgc	gag	cgc	gca	ccc	ttc	cac	ccc	caa	cgg	ctg	cat	gat	ttc	816				
Val	Tyr	Arg	Glu	Arg	Ala	Pro	Phe	His	Pro	Gln	Arg	Leu	His	Asp	Phe					
			260					265					270							
ctc	agc	agc	gag	tgg	acc	aac	gga	aag	tta	ctt	cgg	gcc	aag	ggc	tac	864				
Leu	Ser	Ser	Glu	Trp	Thr	Asn	Gly	Lys	Leu	Leu	Arg	Ala	Lys	Gly	Tyr					
			275				280					285								
tac	tgg	aat	gcc	ggc	cgg	ttc	acc	gag	atc	ggg	agt	att	tct	cag	gcc	912				
Tyr	Trp	Asn	Ala	Gly	Arg	Phe	Thr	Glu	Ile	Gly	Ser	Ile	Ser	Gln	Ala					
	290					295					300									
ggt	cat	ctc	att	cgc	cac	gga	tac	gtc	ggc	cgt	tgg	tgg	aag	ttt	cta	960				
Gly	His	Leu	Ile	Arg	His	Gly	Tyr	Val	Gly	Arg	Trp	Trp	Lys	Phe	Leu					
305					310					315					320					
ccc	cgt	gac	gag	tgg	ccg	gcc	gac	gat	tac	cgt	cgt	gac	gga	atc	ctc	1008				
Pro	Arg	Asp	Glu	Trp	Pro	Ala	Asp	Asp	Tyr	Arg	Arg	Asp	Gly	Ile	Leu					
				325					330					335						
gac	aag	tgg	gaa	gaa	ccc	gtc	gga	gac	tgc	cga	caa	gaa	ctc	gtc	ttc	1056				
Asp	Lys	Trp	Glu	Glu	Pro	Val	Gly	Asp	Cys	Arg	Gln	Glu	Leu	Val	Phe					
			340				345						350							
atc	ggc	caa	gcc	atc	gac	ccg	tct	cga	ctg	cac	cga	gaa	ctc	gac	gcg	1104				
Ile	Gly	Gln	Ala	Ile	Asp	Pro	Ser	Arg	Leu	His	Arg	Glu	Leu	Asp	Ala					
		355					360					365								
tgt	cta	ctc	acc	aca	gcc	gag	atc	gaa	ctc	ggg	cca	gac	gtg	tgg	acc	1152				
Cys	Leu	Leu	Thr	Thr	Ala	Glu	Ile	Glu	Leu	Gly	Pro	Asp	Val	Trp	Thr					
	370					375					380									
acc	tgg	agc	gac	ccc	ctg	ggc	gtc	ggc	tat	acc	gac	cag	acc	gtt	tga	1200				
Thr	Trp	Ser	Asp	Pro	Leu	Gly	Val	Gly	Tyr	Thr	Asp	Gln	Thr	Val						
385					390					395										

<210> 34
 <211> 399
 <212> PRT
 <213> Rhodococcus erythropolis

<400> 34

Met Val Asp Thr Arg Leu Pro Val Thr Val Leu Ser Gly Phe Leu Gly
1 5 10 15

Ala Gly Lys Thr Thr Leu Leu Asn Glu Ile Leu Arg Asn Arg Glu Gly
20 25 30

Arg Arg Val Ala Val Ile Val Asn Asp Met Ser Glu Ile Asn Ile Asp
35 40 45

Ser Ala Glu Val Glu Arg Glu Ile Ser Leu Ser Arg Ser Glu Glu Lys

25

50

55

60

Leu Val Glu Met Thr Asn Gly Cys Ile Cys Cys Thr Leu Arg Glu Asp
 65 70 75 80

Leu Leu Ser Glu Ile Ser Ala Leu Ala Ala Asp Gly Arg Phe Asp Tyr
 85 90 95

Leu Leu Ile Glu Ser Ser Gly Ile Ser Glu Pro Leu Pro Val Ala Glu
 100 105 110

Thr Phe Thr Phe Ile Asp Thr Asp Gly His Ala Leu Ala Asp Val Ala
 115 120 125

Arg Leu Asp Thr Met Val Thr Val Val Asp Gly His Ser Phe Leu Arg
 130 135 140

Asp Tyr Thr Ala Gly Gly Arg Val Glu Ala Asp Ala Pro Glu Asp Glu
 145 150 155 160

Arg Asp Ile Ala Asp Leu Leu Val Asp Gln Ile Glu Phe Ala Asp Val
 165 170 175

Ile Leu Val Ser Lys Ala Asp Leu Val Ser His Gln His Leu Val Glu
 180 185 190

Leu Thr Ala Val Leu Arg Ser Leu Asn Ala Ser Ala Ala Ile Val Pro
 195 200 205

Met Thr Leu Gly Arg Ile Pro Leu Asp Thr Ile Leu Asp Thr Gly Leu
 210 215 220

Phe Ser Leu Glu Lys Ala Ala Gln Ala Pro Gly Trp Leu Gln Glu Leu
 225 230 235 240

Gln Gly Glu His Ile Pro Glu Thr Glu Glu Tyr Gly Ile Ser Ser Val
 245 250 255

Val Tyr Arg Glu Arg Ala Pro Phe His Pro Gln Arg Leu His Asp Phe
 260 265 270

Leu Ser Ser Glu Trp Thr Asn Gly Lys Leu Leu Arg Ala Lys Gly Tyr
 275 280 285

Tyr Trp Asn Ala Gly Arg Phe Thr Glu Ile Gly Ser Ile Ser Gln Ala
290 295 300

Gly His Leu Ile Arg His Gly Tyr Val Gly Arg Trp Trp Lys Phe Leu
305 310 315 320

Pro Arg Asp Glu Trp Pro Ala Asp Asp Tyr Arg Arg Asp Gly Ile Leu
325 330 335

Asp Lys Trp Glu Glu Pro Val Gly Asp Cys Arg Gln Glu Leu Val Phe
340 345 350

Ile Gly Gln Ala Ile Asp Pro Ser Arg Leu His Arg Glu Leu Asp Ala
355 360 365

Cys Leu Leu Thr Thr Ala Glu Ile Glu Leu Gly Pro Asp Val Trp Thr
370 375 380

Thr Trp Ser Asp Pro Leu Gly Val Gly Tyr Thr Asp Gln Thr Val
385 390 395